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ABSTRACT

In this paper differing theories on behavioral psychology are examined as they relate to individual reactions to anxiety producing situations. The focus is on athletes and how personality traits and stress situations influence their behavior and performance. The basic question asked is "How do persons and situations interact in promoting or restricting behavior?". Personality traits of athletes were studied with particular emphasis upon their inclination toward anxiety reactions or their relatively stable attitudes reflecting a low-anxiety profile. Since athletic performance, although related to ability, is also affected by situational factors and motivational factors such as anxiety, it is important to determine how athletes perceive various situations, how this perception affects their anxiety level, and finally how the anxiety might affect performance. Further studies are suggested focusing on how anxiety can be reduced so that persons can function at a level that is closer to their maximum potential. (JD)

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THE INTERACTION MODEL OF ANXIETY:

SOME POSSIBLE IMPLICATIONS

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THE INTERACTION MODEL OF ANXIETY: SOME POSSIBLE IMPLICATIONS

We expect a consistency of performance in athletic endeavors. We talk about winning teams and losing teams, assuming that some teams perform consistently better than others. When a winning team loses a few games, we are surprised and attribute this inconsistency of behavior to "a losing streak". When a superior athlete performs poorly we attribute this to the person having a "bad day"; or being in a "slump"; or not "being up" to his or her usual standard of performance. We talk about people being athletic or not athletic, assuming a consistency of behavior across a wide variety of situations. Is this faith in consistency of athletic behavior justified? It may be in extreme cases where athletic ability is so superior that it is little influenced by motivational, social or personal factors or by situational constraints. However, in most cases consistency in athletic performance is not as high as it appears to be. In most cases the expression of athletic ability is modified and varies as a function of motivational, personal and social situational factors. This is not unique to athletic performance, but is also true, to a large extent, with respect to other aspects of behavior. There is both cross-situational and longitudinal variability of behavior.

Issues and Personality Models

Let us put this in the context of some issues, and models in the field of personality. As indicated elsewhere (Endler and Magnusson, 1976a, 1976b), personality theorizing and research have been primarily influenced by four basic models: trait psychology, psychodynamics, situationism and interactionism. The most influential of these has been the trait model.

The trait model has assumed that actual behavior is primarily determined by latent, stable dispositions. Traits serve as the predispositional basis for apparent response-response (correlational) consistencies of behavior in various situations (e.g., Cattell, 1957; Guilford, 1959). For example, Allport (1937) suggested that traits were general and enduring predispositions to respond, and were not linked to specific stimuli or responses. Cattell (1957, 1965) who sees traits as the basic units in personality does, however, recognize the influence of situations on behavior. On a theoretical level, Cattell's "specification equations" are concerned with situations. Empirically, however, his research does not pay systematic attention to situations. Cattell has focused primarily on the internal determinants of behavior.

Although the various trait theorists agree that traits, which are usually derived by factor analytic procedures, are the basic units of personality, are dispositions, and account for cross-situational consistency, they disagree as to the specific structures, numbers and types of traits. The trait theorists postulate that the major determinants of behavior reside within the person, but they are becoming cognizant that traits interact with situations in evoking behavior.

Psychodynamic theories, for example psychoanalysis, although similar to trait theories in emphasizing internal determinants of behavior, differ from trait theories in a number of respects. Psychodynamic theories postulate a basic personality core which serves as the basis for behavior in a variety of situations. They focus on personality structure (id, ego, and superego), dynamics and development (Freud, 1959). Personality dynamics focuses on the continuous interaction of, and conflict among the id, ego and superego. One

of the consequences of this conflict is anxiety and the person develops defense mechanisms, which are motives, in order to defend the self-concept against this anxiety. Developmentally, according to Freud, experiences serve primarily to modify the expression of instinctual impulses. The neo-Freudians (e.g., Erikson, 1963; Fromm, 1955; Horney, 1945; and Sullivan, 1953) have de-emphasized the role of instincts and psychosexual stages, and have focused instead on psychosocial stages of development, on the ego, and on cultural and social factors. One other important difference between trait and psychodynamic theories is that the former assumes a one-to-one positive monotonic relationship between responses and underlying hypothetical constructs, whereas the latter suggest that there may not always be a one-to-one relationship between hypothetical constructs and overt behavior. Because of defense mechanisms, for example, consistency at the mediating hypothetical construct level may not always lead to consistency at the overt reaction level.

Ichheiser (1943) states that one of the bases that has led to erroneous conclusions about personality is "the tendency to overestimate personal factors and underestimate situational factors in interpreting personality" (p. 151). According to Ichheiser behavior is always determined by both situational and personal factors. Situations influence behavior both as a set of stimuli which provoke responses, and as opportunities for action or obstacles to action. According to Ichheiser (1943) the neglect of situational factors and the emphasis on personal factors is rooted in the ideology and social system of nineteenth century liberalism, which believed that "our fate in social space depended exclusively, or at least predominantly, on

our individual qualities--that we, as individuals, and not the prevailing social conditions shape our lives" (p. 152). Nevertheless, the prevailing sociopolitical and psychological forces of the last half-century (viz. the revolution of rising expectations, Viet Nam, the Cold War, the energy crisis, unemployment, the depression) has led to a shift in emphasis towards attempting to explain behavior in terms of situations and social conditions.

Situationism, especially classical social learning theory (Dollard and Miller, 1950; Dewey and Humber, 1951), has emphasized situational factors as the prime determinants of behavior. The approach of the various social learning theories is not a homogeneous one (see Endler and Edwards, 1977; Endler and Magnusson, 1976b). Although Dollard and Miller (1950), classical behavior theorists, emphasize learning and the importance of situations, they also investigate such organismic variables as drives, motives, and conflict. Bandura (1969, 1971), Mischel (1968, 1976) and Rotter (1954, 1975), modern social behavior theorists, are basically concerned with the person's behavior, rather than with attributed motives and traits. Although emphasizing situational factors, they do incorporate person factors into their theories, as evidenced by Mischel's (1973) discussion of cognitive factors, and by Rotter's (1954, 1975) concept of expectancy. Modern social behavior learning theorists are beginning to emphasize the reciprocal interaction between the situation and the person. (There have been very few attempts at studying situations psychologically. However, we will defer the discussion of this issue to later in the paper.)

Interactional psychology conceives of person by situation interactions as important determinants of behavior. Endler and Magnusson (1976b) state

that "behavior involves an indispensable, continuous interaction between individuals and the situations they encounter. Not only is the individual's behavior influenced by significant features of the situations he or she encounters but the person also selects the situations in which he or she performs, and subsequently affects the character of these situations" (p. 958). As pointed out elsewhere (Endler, 1973) the question of persons versus situations or internal versus external determinants of behavior is basically a pseudo-issue. The appropriate question is really "How do persons and situations interact in promoting or restricting behavior?".

Endler and Magnusson (1976b), and Endler (1977) have presented the four basic features of interactionism. Specifically modern interactionism postulates that: (a) behavior is primarily a function of a continuous multidirectional interaction between the individual and the situation that he or she selects or encounters; (b) the person is an active and intentional agent in this interaction process; (c) on the person side, cognitive variables are essential determinants of behavior, but emotions play a very important role in that they interact with cognitions and with strategies for information processing; and (d) on the situation side, the psychological significance or meaning of the situation is an important determinant of behavior. This means that functional equations of behavior should include a situation factor, a person factor, and the interaction between the two.

In the field of personality, the interaction concept has been examined in at least two ways: (a) in terms of statistical analysis of variance and variance components models which examine interactions of main factors, such as persons, situations, and modes of response, within a data matrix; and (b)

in terms of behavioral process models of behavior which focus on the continuous and reciprocal causation or reciprocal action between behavior and situations. The first approach is concerned with interaction in terms of structure or mechanics and the second in terms of process or dynamics (see Endler, 1975a; Endler and Edwards, 1977).

Measurement models and psychological processes models. One difficulty in evaluating and interpreting personality research is due to the failure to distinguish between personality theories that are models of psychological processes and the measurement models relevant to these theories (Magnusson, 1976; Magnusson and Endler, 1977; Endler, 1977). There is often a failure to distinguish between the methods used for data collection and the responses or reaction variables one is investigating. Magnusson and Endler (1977) point out that there is no necessary one-to-one relationship between the kind of reaction one is investigating and the method one is using for data collection. For example, we can obtain measures of overt behavior by objective measures, by self-reports or by ratings.

The trait measurement model assumes a true trait score for each person. "The assumption of the measurement model is that individual positions on the trait dimension are stable across situations (with variations being due to error) and therefore that the behavior (test score) that reflects this trait is stable across situations " (Endler, 1977, p. 344). This suggests that the rank order of persons with respect to the behavior, representing a trait dimension, is stable across situations.

Basically the empirical studies on the person by situation issue have failed to provide evidence for transsituational consistency (Endler, 1973,

1975a, 1975b; Mischel, 1968, 1969). The defenders of traits have focused on the trait personality theory, whereas the critics of traits, based on the empirical results, have directed their arguments against the trait measurement model.

The trait and psychodynamic models both stress the importance of person factors as determinants of behavior, yet differ in their measurement models. Therefore, they also differ in terms of methods of data collection and data treatment, and also with respect to the kinds of data they collect (Magnusson, 1976; Endler, 1977). The measurement trait model assumes a positive and monotonic relationship between mediating hypothetical variables and overt behavior; the psychodynamic measurement model does not. For example an increase in anxiety, a mediating variable, may at a certain level of intensity, according to the psychodynamic model, lead to a decrease in anxious behavior, a reaction variable, because of defensiveness.

Mediating systems versus behavior systems. Magnusson and Endler (1977) point to the important distinction between mediating variables (intervening variables, hypothetical constructs) and behavioral or reaction variables. Bowers (1977) makes a similar distinction in discussing the difference between a phenomenon and its explanation. Consistency at the mediating level does not necessarily lead to consistency at the reaction level.

Reaction variables include overt behavior, covert reactions (feelings, etc.), physiological reactions and artificial behavior ("test" behavior, role playing). Mediating variables, according to Magnusson and Endler (1977) are inferred from behavioral observations and from phenomenological self-reports. They assist us in understanding, in explaining, and in predicting the processes whereby

both stored information and concurrent stimuli (situations) are selected, transformed and interpreted into responses or reactions. There are at least three types of mediating processes according to Magnusson and Endler (1977), namely structural, content and motivational variables.

The structural variables include such factors as intelligence, abilities, competence and cognitive complexity. It seems reasonable to assume that structural variables are not basically influenced by situational factors, within a normal range of situational conditions. Extreme situations, such as threatening or anxiety provoking situations, however, can and do modify the expression of these variables. Mischel (1968, 1969) and Rushton and Endler (1977) have presented evidence for the consistency of structural variables. Therefore where athletic performance is based primarily on ability, a structural variable, one would expect a fair amount of consistency of performance across different situations. However, as we all know, athletic performance is also influenced by motivational and content variables.

The content variables refer to the situationally determined or stored information, for example the content of hostility arousing situations. The content processed by the mediating system in a specific situation, is determined by the precise cues or stimuli that are selected by or imposed on the individual, and by the stored information that is activated by incoming stimuli. Therefore the content of the mediating process is dependent on situational conditions.

Motivational variables refer to drives, needs, motives, attitudes, and values, and are concerned with arousing, maintaining and directing behavior. These processes are concerned with why the individual selects and treats

information and why the person reacts as he or she does. Since different contents, both stored and situational, evoke different motivational factors, the motivational factors, like the content factors will be influenced by situational factors. According to Magnusson and Endler (1977) the mediating system selects and processes various content and motivational variables in a consistent and coherent way, but the manifestation of the motivational and content variables differ in various situations.

Consistency versus Situational Specificity. The issue of cross-situational consistency versus situational specificity, in personality theory, has been empirically tested in three major ways: (a) via a multidimensional variance components research strategy; (b) via a correlational research strategy; and (c) via a personality-by-treatment experimental (analysis of variance) design.

A number of investigators have reviewed the empirical literature regarding the consistency versus specificity issue (e.g., Argyle and Little, 1972; Bowers, 1973; Endler, 1973, 1977; Endler and Magnusson, 1976b; Magnusson, 1976). The general conclusion is that although there is some evidence for trans-situational consistency and stability over time for intellectual and cognitive factors or structural variables (e.g., Mischel, 1973; Rushton and Endler, 1977), there is little evidence for consistency regarding personality social (content) and motivational variables.

In a direct test of the consistency of cognitive variables versus social variables, within a single investigation, Mariotto and Paul (1975) examined the relative effects of persons versus situations in real-life functioning of chronically institutionalized mental patients. They found that cognitive behavior manifests consistency across situations, but social behavior seems

to be situationally determined. In general, the various studies demonstrate the importance of person by situation interactions.

Multidimensional variance Components Research strategy. Among the first studies on the consistency versus specificity issue, using a multidimensional variance components strategy were those conducted by Raush, Dittman and Taylor (1959a, 1959b) and by Endler and Hunt (1966, 1969). Raush and his colleagues analyzed the ratings of the observed behavior of delinquent boys in six different situations. They found that person by situation interaction accounted for more behavioral variance than either situations or persons per se. Endler and Hunt analyzed subjects responses in various situations, for 22 samples of males and 21 samples of females who had completed the self-report S-R Inventory of Anxiousness (Endler, Hunt and Rosenstein, 1962). They found that on the average individuals (persons) accounted for 4.44 percent of the variance for males and 4.56 percent of the variance for females; situations accounted for 3.95 percent of the variance for males and 7.78 percent for females; and person by situation interactions accounted for 10 percent of the variance. The three simple two way interactions accounted for about 30 percent of the variance. Using the S-R Sport Inventory of Anxiousness, and basketball athletes as subjects, Horsfall, Fisher and Morris (1975) found that individual differences accounted for 9 percent of the variance, situations for 10 percent and person by situation interactions for 10 percent. Bowers (1973) summarizing the results for 11 relevant articles published since 1959 found that person by situation interactions accounted for more variance than either persons or situations on 14 out of 18 possible comparisons. The average variance for persons was 12.71 percent; for situations it was 10.17 percent, and for person

by situation interactions it was 20.77 percent.

In summary, the variance components literature, with respect to personality variables suggests that persons and situations per se each account for less variance than person by situation interactions. Although the results of these studies demonstrate interactions, they do not explain them. In those cases where the variance due to interactions is low, the results indicating that both persons and situations each contribute very little to behavioral variance may not have direct implications for trait psychology, nor for interactionism. It is possible to obtain high consistency (i.e., for the stability of rank orders to be high) even in those instances where the variance due to persons is small (see Endler, 1977). "However, the existence of strong Person X Situation interaction variance is an indirect indication of the lack of stable rank orders (i.e., the lack of consistency) and provides direct evidence for interactionism." (Endler and Magnusson, 1976b, p. 964).

Correlational research strategy. The correlational research strategy provides a more direct test of the assumption of cross-situational stability or consistency. An examination of the correlational research strategy, for various personality variables, suggests that there is no evidence for cross-situational consistency with respect to social and personality variables. However, there is evidence for moderate consistency: (a) for cognitive and intellectual (structural) variables (see Mischel, 1968, 1969; Rushton and Endler, 1977); (b) for various situations that are similar (see Magnusson, Gerzén, and Nyman, 1968; Magnusson and Heffler, 1969; and Magnusson, Heffler and Nyman, 1968), and (c) for stability over time (longitudinal studies) across similar situations (see Block, 1971, 1977). The extent of cross-situational

consistency or situational specificity is, however, related to the variable under consideration.

Personality by Treatment Experimental Designs. The correlational and variance components strategies indicate that interactions are important. They tell us what the state of affairs is. The provide no information as to why (see Sarason, Smith and Diener, 1975) or how persons and situations interact in eliciting behavior (see Endler, 1973). In order to be able to predict the nature of the interactions we need to devise studies that incorporate both personality and situational variables in their experimental designs. A number of recent investigations have been conducted using a personality by treatment experimental design. At this point let us briefly summarize some of the results, and later in this paper we will discuss studies that have special relevance for anxiety.

Regarding the variable of locus of control, Baron and Ganz (1972) and Baron, Cowan, Ganz, and McDonald (1974) found that externals perform better when they are provided with extrinsic feedback, while internals perform better with intrinsic feedback. With respect to attribution of success or failure, Gilmor and Minton (1974) have found a significant interaction of locus of control (person) by success-failure outcome (situation). Fiedler (1971, 1977) found that leadership style (a person variable) interacts with situational factors in influencing group effectiveness. With respect to aggression, Berkowitz (1977) and Moyer (1973) have demonstrated an interaction of person and situation variables. With respect to anxiety Hodges (1968), Endler and Shedletsky (1973), Endler and Magnusson (1977), Flood and Endler (Note 1), and Diveky (Note 2) have all demonstrated trait anxiety (a person variable)

by situational stress interactions, in eliciting state anxiety arousal. The results of these various studies seriously question the assumption of the trait theory that the rank order of individuals is stable and consistent across different situations.

Situations and Interactional Psychology

Prior to discussing the interactional model of anxiety, let us briefly discuss the relevance of situations for interactional psychology. As indicated earlier social learning theorists and sociologists have emphasized situation factors as determinants of behavior. There have been very few attempts to study situations psychologically (see Magnusson, 1971). There are at least two approaches for investigating situations from a psychological perspective, namely situation perception studies and situation reaction studies (see Magnusson and Ekehammar, 1975a, 1975b; Endler and Magnusson, 1976b).

Magnusson (1971, 1974) has developed an empirical psychophysical method for investigating the perception of situations. Magnusson and Ekehammar (1973) with respect to perception of situations found two bipolar situation dimensions (positive versus negative, and active versus passive, which are similar to the semantic differential factors) and one unipolar dimension, a social factor, for the domain of situations they studied. The meaning (perception) of the situation appears to be an essential and influential situation factor that affects a person's behavior.

An investigation of reactions to situations is based on individuals' responses to situations. This method classifies situations in terms of the similarity of behavior they elicit in persons. One attempts to develop taxonomies of situations using this approach. Many of the situation reaction

studies have been conducted on data from inventories constructed for research purposes. Using the S-R Inventory of Anxiousness (Endler, Hunt and Rosenstein, 1962) and factor analysing subjects responses to different situations, Endler, et al. found three situational factors: interpersonal, inanimate physical danger, and ambiguous. Endler and Okada (1975) found similar situational factors for the S-R Inventory of General Trait Anxiousness. These various studies have investigated the dimensionality of the situations in terms of persons' responses to the situations as a whole.

Magnusson and Ekehammar (1975b), and Ekehammar, Schalling and Magnusson (1975) have combined the situation perception and situation reaction strategies within a single study, in order to investigate person by situation reactions. They found a high congruence between the situation perception and the situation reaction data, but there were also some discrepancies. These investigations point to a useful approach for understanding how behavioral reactions are influenced by perceptual (psychological meaning) factors in situations.

The distinction between the objective and psychological characteristics of a situation is an important one as is the distinction between the situation as a whole and the various elements or situational cues within the situation (Magnusson and Endler, 1977). Although many of the situational studies have focused on the situation as a whole, and have compared the effects between different situations, it is also important to investigate the various situational cues within a situation and examine how they continuously interact with one another and change in the process. A situation can be conceptualized as a dynamic process in which an individual selects certain events (e.g., other persons) and elements and is then subsequently affected by these other

elements (see Magnusson, 1976). It is necessary for future investigations of situations to focus on interaction of elements (e.g., person by situation interactions, person by person interactions) within situations.

The Interaction Model of Anxiety

Interactional psychology has both theoretical and practical relevance for the construct of anxiety. Anxiety, which has been defined in many different ways, has generated a tremendous volume of research, various methodological formulations, and a number of attempts at comprehensive theories. Anxiety has, at various times, been defined as a stimulus for behavior, as a complex response, as a personality variable, and as a learned drive. May (1950) has called our era the "age of anxiety". Lewis (1970) defines anxiety as "an emotional state, with the subjectively experienced quality of fear or a closely related emotion (terror, horror, alarm, fright, panic, trepidation, dread, scare)" (p. 77). The emotion of anxiety includes both subjective and manifest bodily disturbances, it is out of proportion to the threat, it is directed toward the future, and it is unpleasant. An understanding of anxiety will contribute to the development of theory, and will hopefully suggest methods for aleviating some of its deleterious effects. Let us examine Spielberger's (1966, 1972) State-Trait theory of anxiety and compare and contrast it with the Endler (1975b) interaction model of anxiety.

State Anxiety and Trait Anxiety: A conceptual distinction. Cicero (see Lewis, 1970) originally distinguished between angor as a transitory state, and anxietas, as a predisposition. More recently, Cattell and Scheier (1958, 1961), and Spielberger (1966, 1972) have elaborated this important distinction between chronic or trait anxiety (A-Trait), a relatively stable personality

characteristic, and state anxiety (A-State), a transitory emotional condition. According to Spielberger (1972), A-State can be defined as an emotional reaction "consisting of unpleasant, consciously-perceived feelings of tension and apprehension, with associated activation or arousal of the autonomic nervous system" (p. 29). A-Trait can be defined in terms of individual differences in anxiety proneness or the tendency to respond with A-State under stress.

Individuals who are high on A-Trait, according to Spielberger (1972), are concerned with "fear of failure" and are self-deprecatory. A-Trait persons are, therefore, more likely to perceive ego involving situations as more threatening than would low A-Trait persons, and would therefore respond with much greater A-State arousal in ego-threatening situations than low A-Trait persons. Under neutral or non-threatening conditions, the difference in A-State between high and low A-Trait persons should be minimal.

Spielberger's (1972) theory can be reconceptualized in terms of an interaction between A-Trait (persons) and ego-threatening situations in arousing A-State. Nevertheless, Spielberger's state-trait theory, is somewhat restrictive because the instrument used to assess A-Trait, the State-Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch and Lushene, 1970) emphasizes interpersonal or ego-threatening trait anxiety, and ignores the other dimensions (e.g., physical danger and ambiguity) of multidimensional A-Trait. Endler and Okada (1975) and Endler and Magnusson (1976c) have provided evidence to indicate that trait anxiety is multidimensional. There is also evidence to indicate that A-State is multidimensional (see Endler and

Magnusson, 1976c). Sarason(1975a, 1975b) and Wine (1971) have suggested that there are at least two components of A-State, namely a cognitive worry component and an emotional arousal component. Sarason (1975b) has pointed out that anxiety is related to self-evaluation, and that the highly anxious individual is self-centered and focuses on self-worry and self-evaluation, rather than on the situational task. Since these cognitive components have a more negative influence on performance, than do autonomic factors, it is suggested that the worry components of A-State may be more amenable to change. This has practical implications for athletic performance. It suggests that an alleviation of cognitive worry via cognitive appraisal (see Meichenbaum, 1975) might well improve athletic performance. An interaction model of anxiety must take into account the multidimensionality of both A-Trait and A-State.

Person by Situation Interactions and State-Trait Anxiety. The interaction model of anxiety (Endler, 1975b) assumes that both A-Trait and A-State are multidimensional. A second basic assumption of this model is that for the trait (person) by situational stress interaction to be effective in inducing A-State, it is essential for the A-Trait measure to be congruent to the threatening situation. The S-R Inventory of General Trait Anxiousness (S-R GTA) developed by Endler and Okada (1975) assesses four facets of A-Trait, namely, interpersonal ego-threat, physical danger, ambiguous and innocuous or daily routines. Recently a fifth facet, namely, social evaluation threat was added. The interactional model of anxiety would predict that interpersonal ego-threat A-Trait will interact with a congruent interpersonally ego-threatening situation in evoking A-State changes, but will not interact

with a non-congruent physically dangerous situation in eliciting changes in A-State. However, physical danger A-Trait will interact with a congruent physically dangerous situation in eliciting A-State arousal changes. A derivative of this theory is the differential hypothesis, which predicts significant interactions when situational threats and facets of A-Trait are congruent, and no interactions when they are not congruent. This interactional model enables us to predict rather than postdict, the direction and nature of the interaction between (anxiety) traits and situational factors, and to investigate their joint effects on behavior, such as anxiety states.

Empirical Studies relevant to the Interactional Model of Anxiety. Hodges (1968), O'Neil, Spielberger and Hansen (1969), and Rappaport and Katkin (1972) all found that under ego-threatening conditions (situations) high A-Trait persons (as assessed either by the STAI A-Trait scale or the Taylor, 1953, Manifest Anxiety Scale, which primarily assess ego-threatening anxiety) show greater changes in A-State than do low A-Trait persons. However, Hodges (1968), Katkin (1965) and Auerbach (1973) found no interaction between physical danger situations and non-congruent A-Trait (primarily ego-threatening) in eliciting changes in A-State arousal.

At this point let us briefly summarize some experiments from our laboratory and from studies in real-life situations that have direct relevance for the interactional model of anxiety. In one of the laboratory studies (reported in Endler and Okada, 1975) we examined the joint effects of physical danger A-Trait (as assessed by the S-R GTA) and a physically threatening situation. Undergraduate male and female university students served as subjects

in an experiment where threat of shock was the physical danger situation. We found that, for female subjects, there was an interaction between physical danger A-Trait and the situation (non-stress versus physical danger stress) in eliciting A-State, as measured by the Behavioral Reactions Questionnaire (BRQ) (Hoy and Endler, 1969; Endler and Okada, 1975). When subjects were classified on the basis of interpersonal A-Trait, there was no interaction between physical danger situational stress and non-congruent interpersonal A-Trait. The differential hypothesis was, thus, confirmed for the female subjects. (However, it was not confirmed for the male subjects.)

In a study at the University of Stockholm, Endler and Magnusson (1977) investigated the interaction model of anxiety in a real-life examination situation. Trait anxiety of Swedish college students was assessed via the multidimensional S-R GTA prior to an important psychology exam, and state anxiety was measured by the self-report BRQ and by pulse rate, just prior to the examination (stress) and again two weeks later (non-stress). When pulse rate was used as the dependent variable, the interaction between interpersonal A-Trait and the examination situation was significant ($p < .01$), and when the BRQ was used as the dependent variable, the interaction was in the right direction and approached significance ($p < .086$). Except for the interaction between the examination and physical danger A-Trait ($p < .05$) for the BRQ scores, none of the remaining six (non-congruent) interactions were significant. Therefore the differential hypothesis (significant interactions for congruent traits and situations; no interactions for non-congruent traits and situations) was partially confirmed. This study also provided evidence for the multidimensionality of A-Trait.

In a recent B.A. honors thesis, Diveky (Note 2) studied middle management bankers in both non-stressful "off the job" situations and stressful (social evaluation) "on the job" situations. She found a significant social evaluation A-Trait by congruent social evaluation situational stress interaction in eliciting changes in A-State. There were no significant interactions between the social evaluation situations and the non-congruent facets of A-Trait.

The person by situation interaction model has also been studied in the field setting of a major track and field meet by Flood and Endler (Note 1). In this real-life athletic competition situation, Flood and Endler predicted that there would be a significant interaction between social evaluation A-Trait and a congruent ego-threatening (social evaluation) track and field meet situation in inducing changes in A-State. They also predicted no significant interactions between the other non-congruent facets of A-Trait (e.g., ambiguous, physical danger and innocuous) and the track and field ego-threat situation. Male athletes (N=41), aged 15 to 30, competing in short-, middle- and long-distance track events completed a modified form of the Endler and Okada (1975) S-R GTA (which included interpersonal, social evaluation, physical danger, ambiguous and innocuous situations), and the BRQ measure of A-State two weeks prior to competition. This constituted the non-stress condition. The measure of A-State, the BRQ, was completed again prior to a major competition that the athletes considered important (the stress condition) and that they <u>perceived</u> as a social evaluation situation. There was a significant interaction between social evaluation A-Trait and the stressful track and field situation, so that high social evaluation A-Trait athletes showed greater increases in A-State between the non-stress and stress situation, than did low A-Trait athletes.

There were no significant interactions between the situation and the physical danger, ambiguous or interpersonal facets of A-Trait. (For innocuous A-Trait the high and low groups did not differ on A-State for the stressful condition, but did differ on the non-stressful condition.) Essentially this study supports the differential hypothesis and the interaction model of anxiety.

It should be noted that in all the studies reported above, both high and low A-Trait individuals manifest greater A-State under stressful conditions than under non-stressful conditions. That is, stress is effective in inducing increases in A-State. The implication of this is that one can also reduce A-State by decreasing threat, or at least, altering the person's perception of the threat so that he or she perceives it as less threatening.

Implications

The results imply that anxiety is not consistent across situations and that anxiety is an important construct. In a recent study with athletes at Ithaca College, Fisher, Borowicz, and Morris (Note 3) have found similar results for the construct of rigidity. They found that rigidity of behavior is not consistent across various sport situations and that one cannot predict a person's decisions in various sport situations as a function of his or her behavioral rigidity. This implies an interaction between rigidity and the situation for predicting decisions people will make in various situations. Fisher et al. state that "as yet concrete evidence that individuals can predict behavior from psychological variables has not been demonstrated with any certainty. It is not surprising then that sport behavior and performance is just as unpredictable and elusive." (Note 3, p. 10).

What specific implications do the studies of the interactional model of anxiety have for athletes and for athletic performance? The implications are limited in that the studies only deal with part of the process. These studies have focused on the antecedents of anxiety, but have not been concerned with the consequences of anxiety for athletic performance. Therefore, subsequent studies should focus on how anxiety affects athletic performance and how one can reduce anxiety so that persons can function at a level that is closer to their maximum potential. We will return to this point shortly.

Nevertheless, the studies are instructive, in that the interactional model focuses on the complexity of anxiety and the role of person by situation interactions in evoking changes in A-State. This approach can serve as a model for other aspects of behavior and indicates that we should not expect consistency in behavior, be it anxiety or athletic performance.

Since athletic performance, although related to ability, is also affected by situational factors and motivational factors such as anxiety, it is important to determine how athletes perceive various situations, how this perception affects their anxiety level, and finally how the anxiety might affect performance. That is, it is necessary to examine the whole process. We need to isolate the types of situations that make various people anxious and what aspects of the situation they perceive as threatening. For example, in a study with 10 year old hockey goalies, that Sue Wilson and I were conducting at York University, we were originally certain that being a hockey goalie would be perceived as a physically threatening situation. Much to our surprise, it was perceived primarily as a social evaluation ego-threatening situation. The young boys were more concerned with "letting the team down" than

with the potential physical danger of being hit by a puck. Similarly, in a study I conducted in Sweden on students going to a dentist, it was assumed that this would be perceived as a physical threat situation. However, the students were more concerned about how the dentist and nurse would perceive them, than they were by the potential physical pain.

In order to understand the total process, it might be useful to have athletes keep a log of their various activities, in which they would indicate how they perceive various situations and how they react to them. If a person is high on social evaluation A-Trait, and perceives a situation, such as a basketball game, as being a social evaluation situation, we know that his or her level of A-State will probably increase. Via cognitive reappraisal techniques (Meichenbaum, 1975) we would attempt to alter the person's perception of the situation, so that it would be perceived as less threatening and this should then reduce the level of A-State, thus facilitating more effective performance. By shifting a person's focus from self-preoccupation to task orientation (via modeling, positive feedback, etc.) the cognitive component of state anxiety should be reduced and improved performance should result.

In the past we have placed too much emphasis on the person and not enough on the situation. We have to examine the demands of specific situations, and see how they interact with person variables in affecting behavior, but cannot assume that the same techniques will be equally effective with all people. For some individuals, and in some situations, modeling techniques will be most effective in improving performance, while for other individuals, and in other situations positive feedback will be most effective. By gaining some

insights as to how persons and situations interact with respect to behavior we might be able to improve our predictions of performance. Horsfall, Fisher, and Morris (1975) suggest that one of the tasks for sport psychologists is to determine the person by situation interactions in various sporting environments. This will enable them to improve their predictions of athletic behavior in various situations.

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